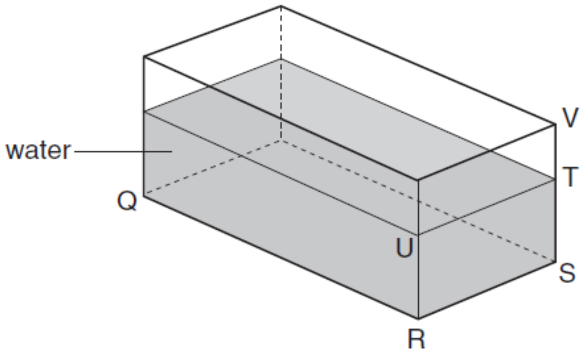
Measurements

Choose the one correct answer from the given choices

1 A glass tank contains some water.

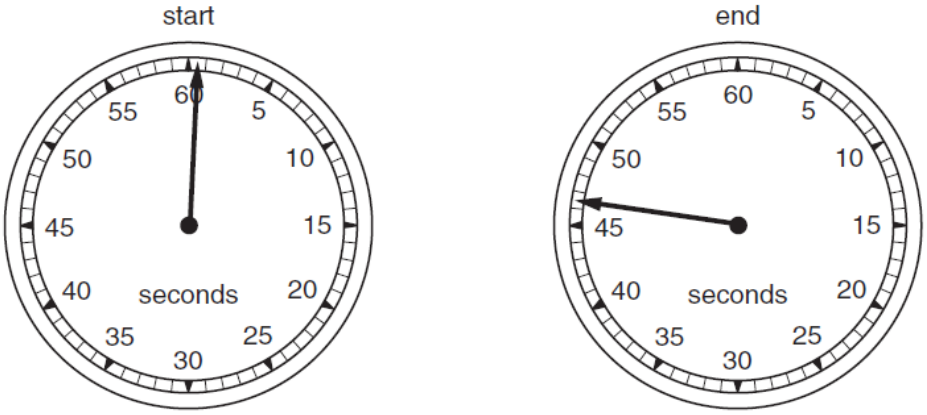


The length QR and the width RS of the tank are known.

What other distance needs to be measured in order to be able to calculate the volume of the water?

A ST **B** SV **C** TU **D** TV

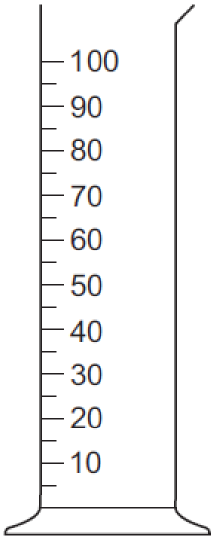
2 A stopwatch is used to time a race. The diagrams show the watch at the start and at the end of the race.



How long did the race take?

A 45.7 s **B** 46.0 s **C** 46.5 s **D** 47.0 s

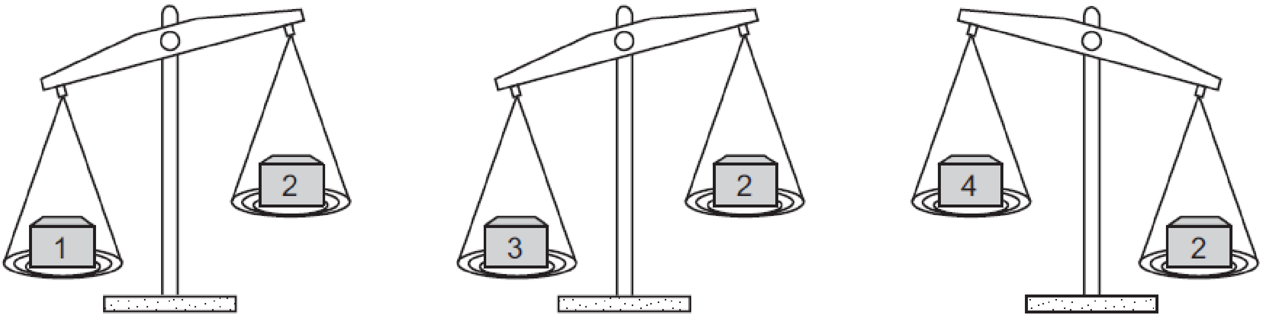
3 The diagram shows a measuring cylinder.



Which unit would be most suitable for its scale?

A mm^2 **B** mm^3 **C** cm^2 **D** cm^3

4 The weights of four objects, 1 to 4, are compared using a balance.



Which object is the lightest?

A object 1 **B** object 2 **C** object 3 **D** object 4

5 A decorator wishes to calculate the area of a bathroom tile so that he can estimate the amount of adhesive that he needs to buy.

What must he use?

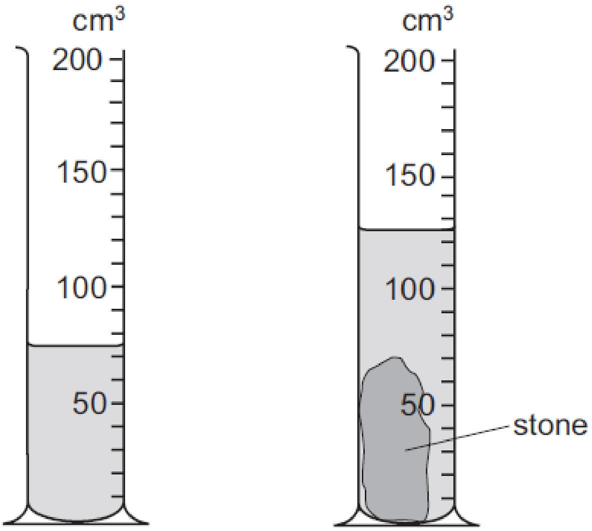
A a measuring cylinder only

B a ruler only

C a measuring cylinder and a clock only

D a measuring cylinder and a ruler only

6 A measuring cylinder contains some water. When a stone is put in the water, the level rises.



What is the volume of the stone?

A 50 cm^3 **B** 70 cm^3 **C** 75 cm^3 **D** 125 cm^3

7 To mark a temperature scale on a thermometer, fixed points are needed.

Which is a fixed point?

A the bottom end of the thermometer tube

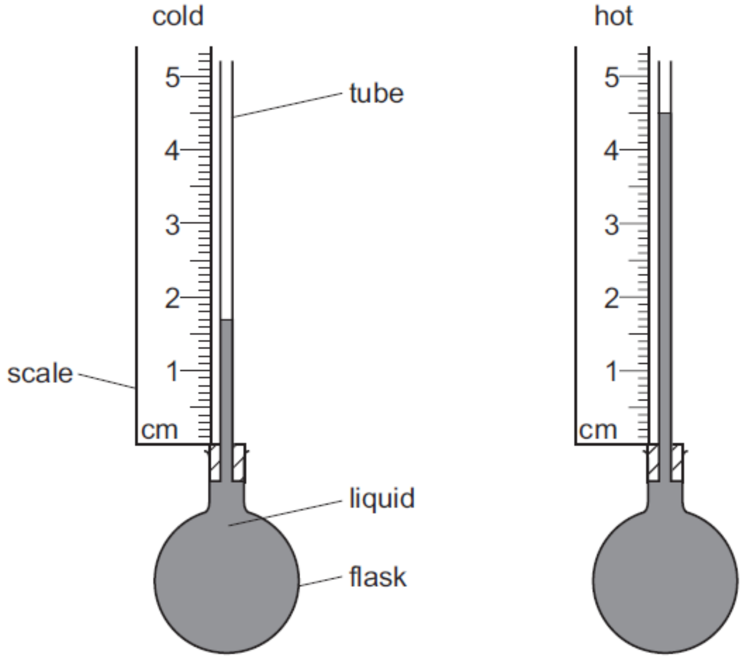
B the top end of the thermometer tube

C the temperature of pure melting ice

D the temperature of pure warm water

8 Some liquid is heated in a flask.

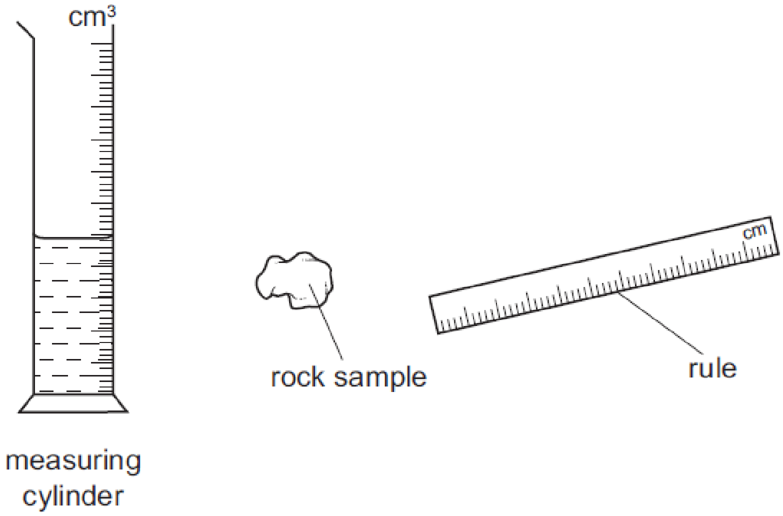
The diagrams show the height of the liquid in the tube when the liquid is cold and when it is hot.



What is the difference in the heights?

A 1.7 cm **B** 2.8 cm **C** 3.2 cm **D** 4.5 cm

9 A scientist needs to determine the volume of a small, irregularly shaped rock sample. Only a rule and a measuring cylinder, partially filled with water, are available.



To determine the volume, which apparatus should the scientist use?

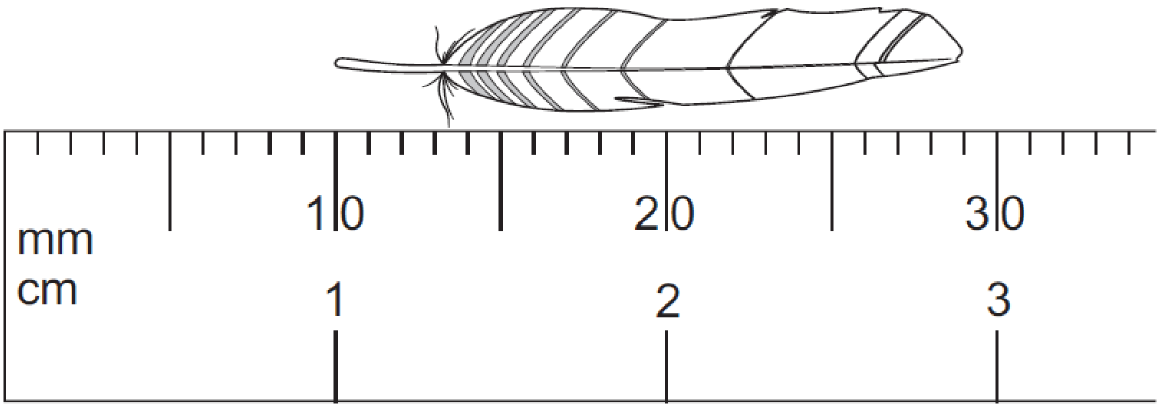
A both the measuring cylinder and the rule

B neither the measuring cylinder nor the rule

C the measuring cylinder only

D the rule only

10 The diagram shows an enlarged drawing of the end of a metre rule. It is being used to measure the length of a small feather.

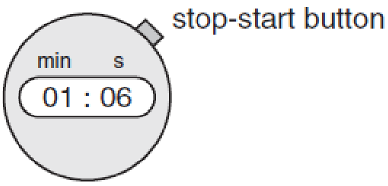


What is the length of the feather?

A 19 mm **B** 29 mm **C** 19 cm **D** 29 cm

11 The diagram shows a stopwatch, originally set at 00:00.

When a car was first seen, the stop-start button was pressed. When the car passed the observer, the stopwatch showed 01:06.



How long did the car take to reach the observer?

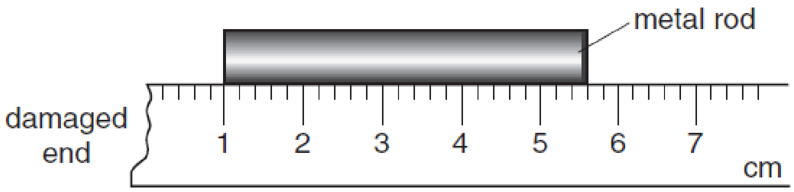
A 1.06 seconds

B 6 seconds

C 66 seconds

D 106 seconds

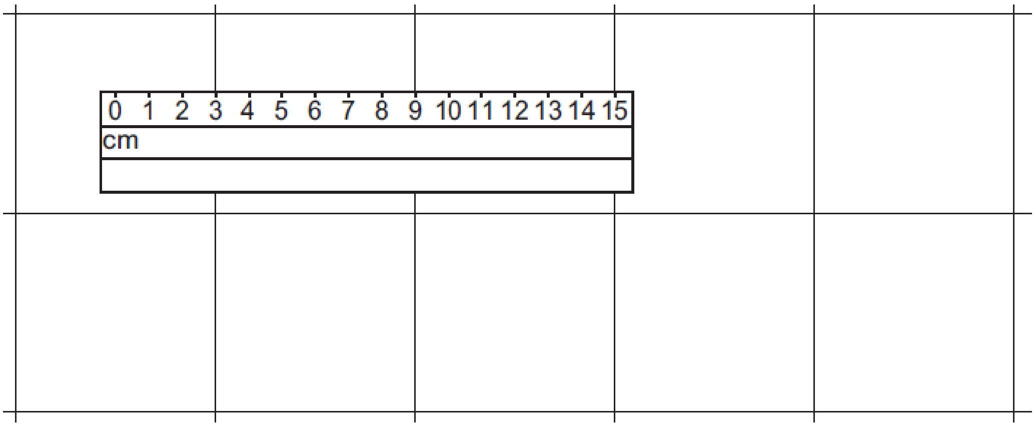
12 A girl uses a rule to measure the length of a metal rod. Because the end of the rule is damaged, she places one end of the rod at the 1 cm mark as shown.



How long is the metal rod?

A 43 mm **B** 46 mm **C** 53 mm **D** 56 mm

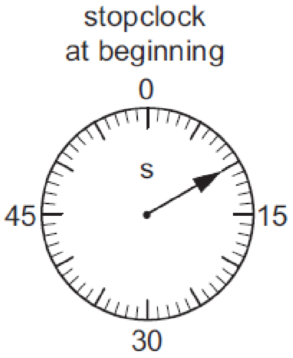
13 A floor is covered with square tiles. The diagram shows a ruler on the tiles.

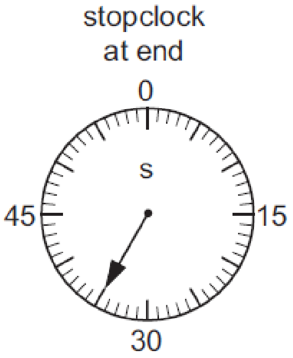


How long is one tile?

A 3 cm **B** 6 cm **C** 9 cm **D** 12 cm

14 The diagrams show the times on a stopclock at the beginning and at the end of an experiment.

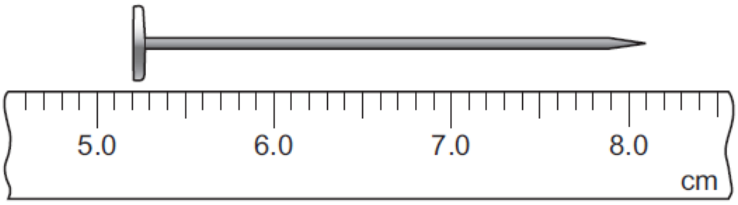




How long did the experiment take?

A 10 s **B** 25 s **C** 35 s **D** 45 s

15 A ruler is used to measure the length of a nail.



What is the length of the nail?

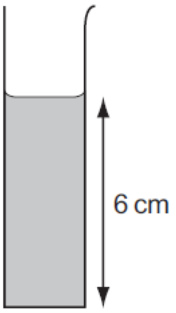
A 1.3 cm **B** 2.9 cm **C** 5.2 cm **D** 8.1 cm

16 Some water is poured into four tubes of different cross-sectional areas.

Which tube contains the largest volume of water?

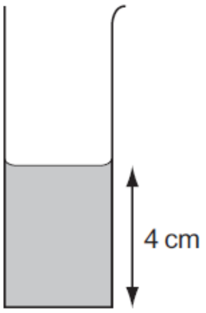
A

area = 10 cm^2



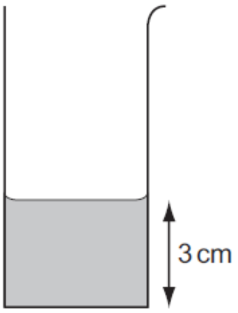
B

area = 20 cm^2



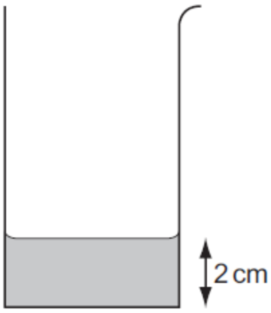
C

area = 30 cm^2



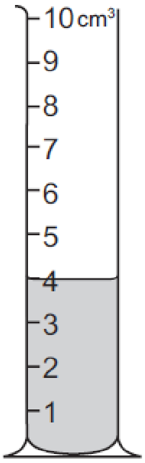
D

area = 40 cm^2

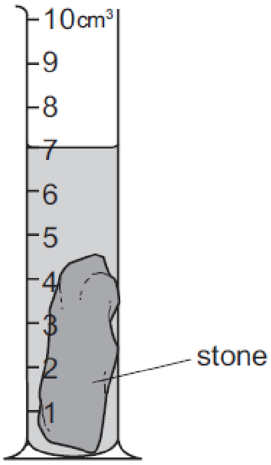


17 The diagrams show an experiment to determine the volume of a stone.

without stone



with stone



What is the volume of the stone?

A 3 cm^3 **B** 4 cm^3 **C** 7 cm^3 **D** 11 cm^3

Answer the following questions

1 **(a)** A measuring cylinder contains 100 cm^3 of water. 20 cm^3 of the water is poured into a beaker.

On Fig. 1.1, mark the level of the water left in the cylinder. [2]

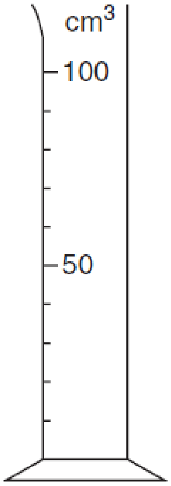


Fig. 1.1

(b) A rule, calibrated in cm, is placed alongside the measuring cylinder, as shown in Fig. 1.2.

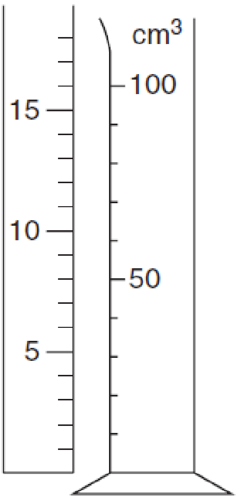


Fig. 1.2

(i) What is the length of the measuring cylinder, from zero up to the 100 cm^3 mark?

....

(ii) The volume of a cylinder is found using the equation

volume = cross-sectional area × length.

Calculate the cross-sectional area of the measuring cylinder.

cross-sectional area = ...

[5]

2 Fig. 2.1 is a full-size diagram of a rectangular block.

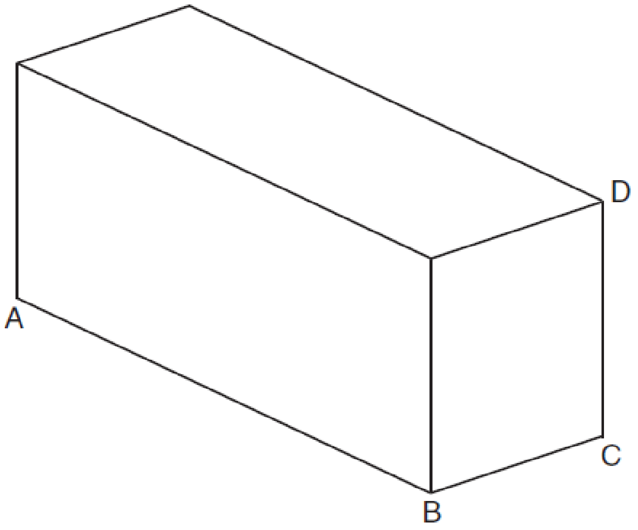


Fig. 2.1

(a) Use your rule to measure the lengths of the three sides AB, BC and CD. Write your values below, in cm, to 2 significant figures.

length of AB = ... cm

length of BC = ... cm

length of CD = ... cm [2]

(b) Write down the equation you would use to calculate the volume of the block. Do **not** attempt a calculation.

[1]

(c) If you used your values from **(a)**, what would be the unit for the volume of the block?

unit of volume = ... [1]

3 Fig. 1.1 shows a measuring cylinder containing water.

Fig. 1.2 shows the same measuring cylinder after stone A has been lowered into it on a fine string.

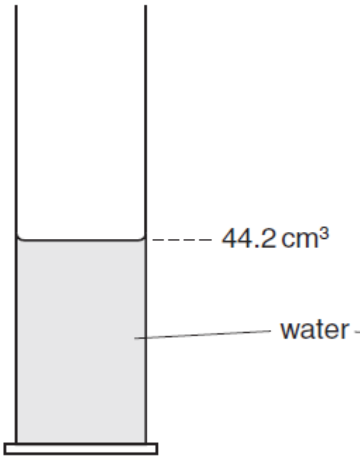


Fig. 1.1

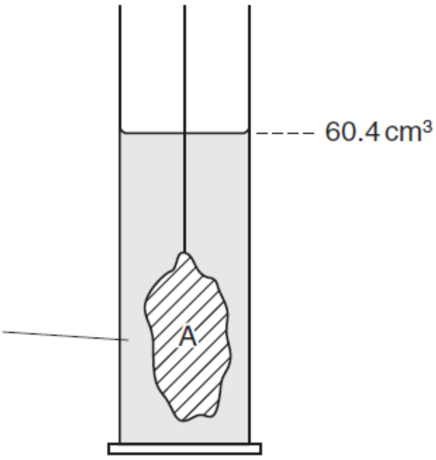


Fig. 1.2

(a) Calculate the volume of stone A.

volume = ... cm^3 [2]

4 The volume of a stone is to be found using the equipment illustrated in Fig. 1.1.

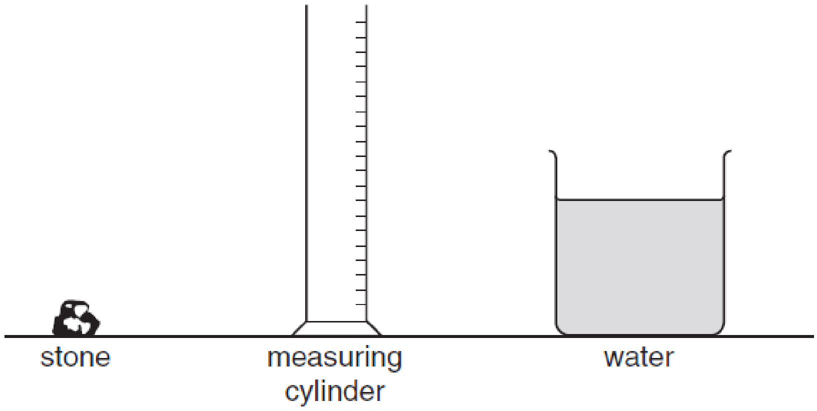


Fig. 1.1

The following five steps are intended to describe how the volume of the stone is found.

Complete the sentences by adding appropriate words.

(a) Pour some .... into the measuring cylinder. [1]

(b) Take the reading of the .... from the scale on the measuring cylinder. [1]

(c) Carefully put .... into the measuring cylinder. [1]

(d) Take the new reading of the .... from the scale on the measuring cylinder. [1]

(e) Calculate the volume of the stone by ....

....

.... [2]

[Total: 6]

5 Fig. 1.1 shows the top part of a measuring cylinder containing some liquid.

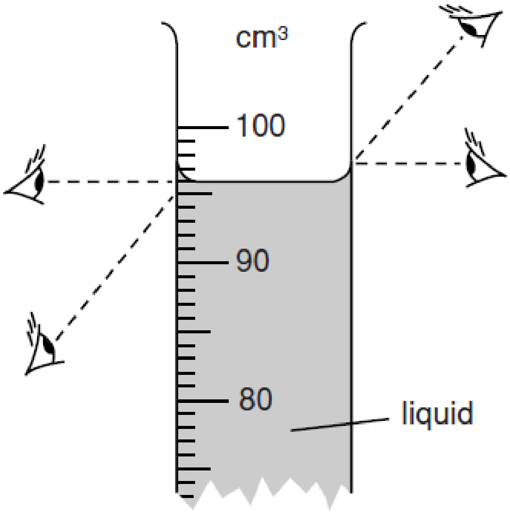


Fig. 1.1

(a) What is the volume of liquid in the measuring cylinder?

volume = ...cm^3 [1]

(b) Fig. 1.1 indicates four ways the observer's eye could look when taking the reading from the measuring cylinder. Put a circle around the eye position that gives the correct reading. [1]

6 Fig. 5.1 shows a liquid-in-glass thermometer.

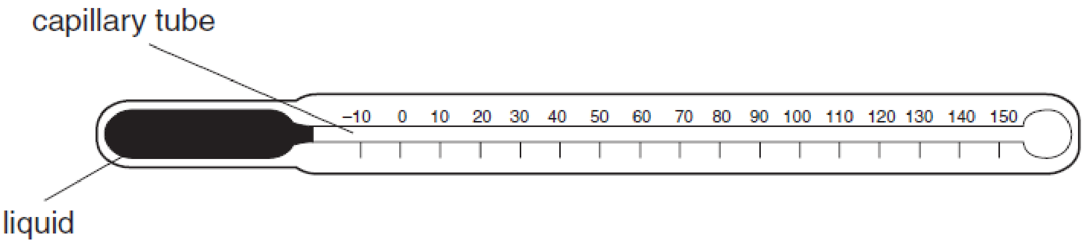


Fig. 5.1

(a) The thermometer is used for measuring temperatures in school laboratory experiments.

State the units in which the temperatures are measured. .... [1]

(b) On Fig. 5.1, mark where the liquid thread will reach when the thermometer is placed in

(i) pure melting ice (label this point ICE), [1]

(ii) steam above boiling water (label this point STEAM). [1]

7 Fig. 1.1 shows a measuring cylinder containing some water.

A student allows 200 drops of water to fall into the water in the measuring cylinder. Fig. 1.2 shows the measuring cylinder after the addition of the drops.

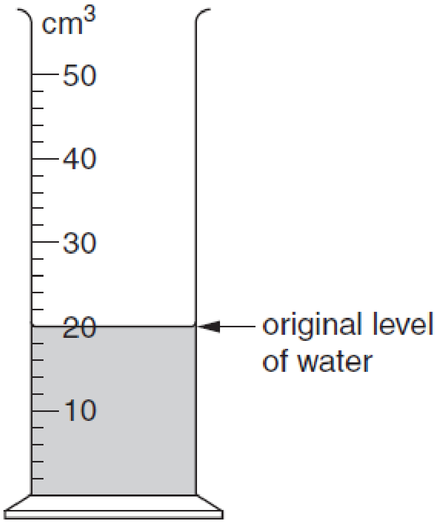


Fig. 1.1

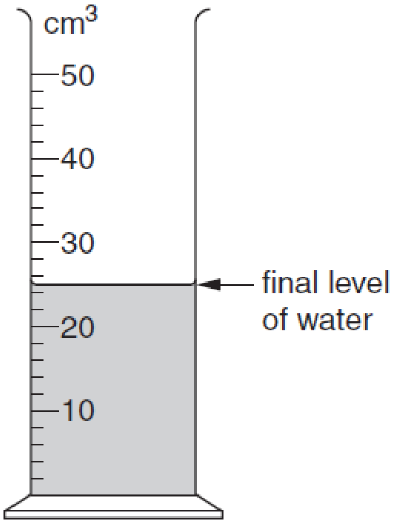


Fig. 1.2

(a) State

(i) the original volume of water in the cylinder,

.... cm^3

(ii) the final volume of water in the cylinder.

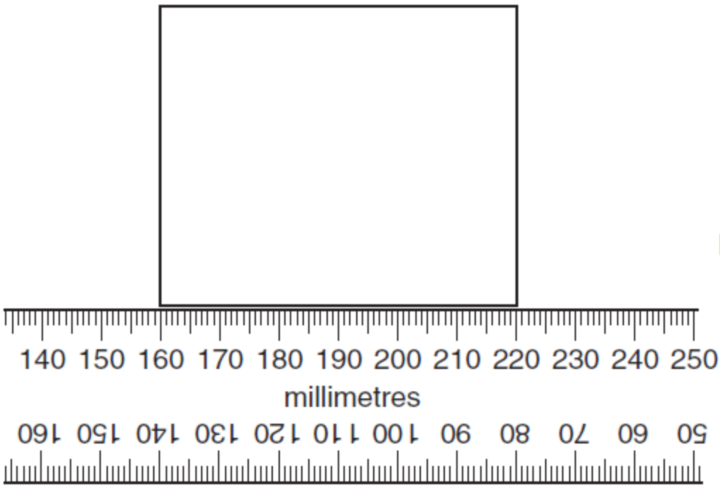
.... cm^3
[1]

(b) Calculate the volume of water added.

volume added = ... cm^3 [1]

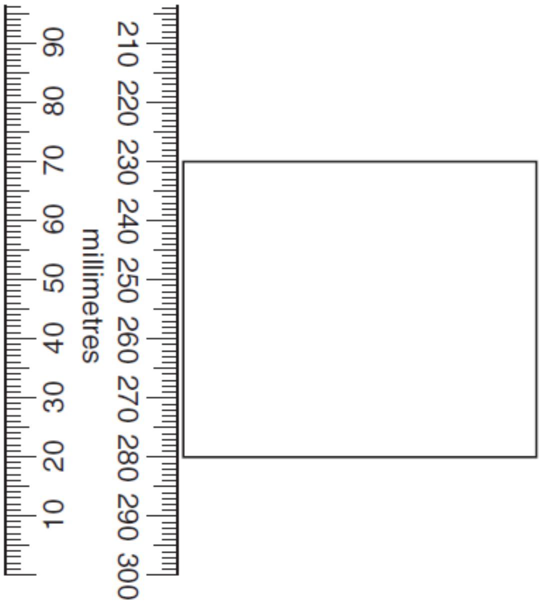
8 **(a)** **(i)** Figs. 1.1 and 1.2 show the dimensions of a rectangular block being measured using a ruler. They are not shown full size.

Use the scales shown to find the length and the width of the block, giving your answers in cm.



length of block .... cm [1]

Fig. 1.1



width of block .... cm [1]

Fig. 1.2

(ii) When the block was made, it was cut from a piece of metal 2.0 cm thick.

Calculate the volume of the block.

volume = ... cm^3 [2]